ROGERS CORPORATION
Advanced Circuit Materials

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Data Sheet

R/flex® 2001 Circuit Material
High Performance Material System

Description

The R/flex® 2001 high performance circuit material system was formulated in response to industry requirements for high peel strength and IPC-FC-241 and 232/1 performance. The R/flex 2001 material system, consisting of high performance polyimide film based laminates, cover sheet, and bonding film, offers wide process latitude, high bond strength and solvent resistance. Low moisture absorption and closely controlled adhesive thickness help to provide excellent electrical performance in demanding applications.

The family of R/flex flexible circuit materials is manufactured under vigorous process control. Process capabilities are continuously monitored for all critical properties, such as peel strength and dimensional stability. Our manufacturing process assures that R/flex circuit materials are as consistent from lot-to-lot as they are from roll-to-roll and within a roll.

Product Features

- High bond strength and excellent solvent resistance provides wide process latitude
- Low moisture absorption and closely controlled adhesive thickness, provide excellent electrical performance in critical applications
- Laminates available in rolls for economic continuous roll-to-roll fabrication
- Contains no Biphenyls or Biphenyloxide compounds, meeting emerging European standards for environmental safety. No CFC's are contained in or used in the manufacture of these materials

Applicable Specifications

Laminate IPC-FC-241/1, Revision C, Class 3
Coversheet and Bonding Film IPC-FC-232/1, Revision C, Class 3

Available Configurations: Many available configurations are not standard; please check with your Rogers representative.

Laminates

Copper weight: $^1/_3$*, $^1/_2$, 1, or 2 oz./ft.^{2} treated rolled annealed copper. (Other copper foils available on special order). * $^1/_3$ oz. - *available single sided laminate only.*

Polyimide film thickness: $^1/_2$, 1, 2, 3, or 5 mils
(13, 25, 50, 75, 125 µm)

Adhesive Thickness: Standard laminate adhesive thickness is 1 mil nominal. (Adhesive thickness of 0.5 mil available on special order)

Sizes:
Laminate available in rolls:
- 24" (610mm) wide

Laminate also available in sheets upon special order.

Laminate Designation (L)

R/flex 2001-L-XXX

0, 5, 7 Designate type of PI film
Side 1 copper thickness oz./ft^2
Polyimide film thickness mils**
Side 2 copper thickness in oz./ft^2

Coversheet and Bonding Film

Adhesive thickness: $^1/_2$, 1, 2, or 3 mils
(13, 25, 50, 75 µm)

Polyimide film thickness: $^1/_2$, 1, 2, 3 or 5 mils
(13, 25, 50, 75, 125 µm)

Sizes: Coversheet and Bonding Film available in rolls:
- 24" (610mm) wide

Coversheet and Bonding Film also available in sheets upon special order.

Coversheet (C) and Bonding Film (B) Designation

R/flex 2001-C-XX0
B-XXX

Side 1 adhesive in mils
Polyimide film thickness in mils**
Side 2 adhesive thickness in mils
***Use "H" for $^1/_2$ mil Polyimide.*

Storage

R/flex® 2001 coversheets and bonding films use B-staged adhesive systems that will retain their original properties for twelve months if stored at 40-70°F (4-21°C) in their original packaging. It is recommended that laminates be stored in a clean and dry area.

СИФОН техноджис

Typical Values

Property		Units	Laminate (1 oz. 1 mil -1 oz/25µm)	Coversheet (1 mil/25µm)	IPC/1 Specifications
Electrical Properties					
Dielectric Constant, ε_r		@ 1 MHz	3.2	3.2	max. 4.0
Dissipation Factor, tan δ		@ 1 MHz	0.011	0.011	max. 0.04
Dielectric Strength		volts/mil	>4250	>4250	min. 2000
Insulation Resistance		megohms	10^7	10^7	min. 10^3
Volume Resistivity		megohms	10^7	10^7	min. 10^6
Surface Resistance		megohms	10^8	10^8	min. 10^5
Moisture insulation resistance		megohms	10^5	10^5	min. 10^2
Physical and Thermal Properties					
Flammability			NR	NR	NR
Moisture Absorption		%	2.6	2.6	max. 6.0
Solder float (method B)			PASS	PASS	550°F/10 sec.
Dimensional stability					IPC-TM-650, 2.2.4
	Method A (MD)	%	NA	-0.04	0.20
	Method B (MD)	%	-0.05	NA	0.15
	Method C (MD)	%	-0.12	NA	0.20
Mechanical Properties					
Peel Strength					
As received	treated copper	lb./in. (N/m)	11(1925)	10 (1750)	8 (1400)
	untreated copper	lb./in. (N/m)	NA	6 (1050)	4 (700)
After solder float	treated copper	lb./in. (N/m)	11 (1925)	11 (1925)	7 (1225)
	untreated copper	lb./in. (N/m)	NA	6 (1050)	3.5 (612)

Coversheet Lamination Conditions

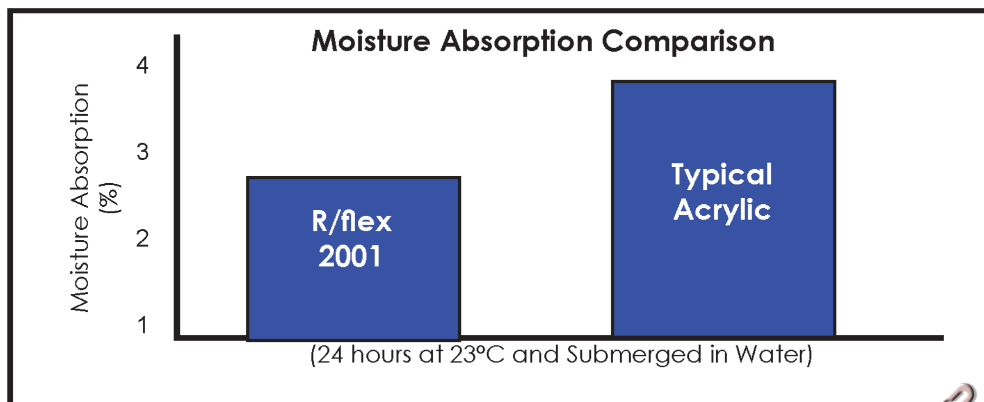
Temperature: 285-390°F (140-200°C)

Time: 45-120 minutes (at temperature)

Pressure: 300 - 400 psi (200 - 250 psi autoclave)
[21.1-28.1 Kg/cm² (14.6-17.1 Kg/cm² autoclave)]

- Cold start, apply pressure first
- Ramp rate - 10°F/minute (5°F/minute for autoclave)
- Cool down to 100°-120°F (38°C - 49°C) before releasing pressure

These times and temperatures are suggested as a starting point in the process of determining conditions suitable for bonding coversheet materials to copper clad laminate. Please note that conditions may vary with the equipment used, and it is expected that some optimization will be required.



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